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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Heinrich Bollmann, et al.	:	
Serial No.	:	09/456,371	: **Group:**	1771
Atty. No	:	12010	: **Examiner:**	Chang, Victor S.
Filed	:	December 8, 1999	:	
Title	:	COMPOSITE ELEMENTS COMPRISING (i) THERMOPLASTIC POLYURETHANES AND (ii) MICROCELLULAR POLYURETHANE ELASTOMERS		

BRIEF ON APPEAL

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Subsequent to the filing of the Notice of Appeal on July 26, 2004, Applicants now submit a brief in support of the appeal in response to the Final Rejection set forth in the Office Action dated May 11, 2004. A single copy of this Appeal Brief is being submitted in accordance with 37 C.F.R. §41.37 and this Appeal Brief is accompanied by the required fee under §41.20(b). Applicants also submit herewith a petition for a three-month extension of time.

Real Party in Interest

The inventors assigned this application to BASF Aktiengesellschaft as evidenced by an assignment recorded at reel 010464, frame 0286.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 19, 20, 22, 23, and 30 are on appeal and are attached hereto in the Appendix. Claims 11-18, 21, and 24-29 have been cancelled. Claims 19, 20, 22, 23, and 30 stand finally rejected under 35 U.S.C. §103(a).

Status of Amendments

All amendments have been entered and are reflected in the claims in the Appendix.

Summary of Claimed Subject Matter

The subject application claims a composite damping element received in a transverse link, a longitudinal link, a triangular link, a rear-axle subframe, a stabilizer, a spring-strut support, or a shock-absorber. The composite damping element comprises i) a thermoplastic polyurethane molding and ii) a microcellular polyurethane elastomer layer *(see page 1, lines 5-15 and page 2, lines 13-25 of the originally filed specification)*. The thermoplastic polyurethane molding (i) has a thickness of from 2 to 10 mm. The microcellular polyurethane elastomer layer (ii) is chemically bonded to and in direct contact with at least one surface of the thermoplastic polyurethane molding such that the microcellular polyurethane elastomer layer dampens and absorbs vibrations of the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-

strut support, or the shock-absorber *(see page 9, lines 4-15 of the originally filed specification and Figures 1-3)*.

Grounds of Rejection to be Reviewed on Appeal

Claims 19, 20, 22, 23, and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bauvois (United States Patent No. 5,288,442) in view of Krech (United States Patent No. 6,063,824).

Argument

Rejection under 35 U.S.C. §103(a)

Claims 19, 20, 22, 23, and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bauvois (United States Patent No. 5,288,442).

Bauvois discloses forming a complex molded structure, especially a ski *(see col. 1, lines 9-10)* and the complex molded article is traditionally meant to be a molded structure comprising stiffening or reinforcing elements. The stiffening or reinforcing elements may be in the form of wires or in the form of cloths, or even in the form of plates, protection elements, and/or various mechanical elements such as, for example, damping elements, lightening elements, and/or decoration elements *(see col. 1, lines 12-20)*.

Referring to Figure 2 of Bauvois, a decorative element 11 is formed from multiple layers. An innermost layer is a generally described as a foam core 16 surrounded by a polyurethane shell 13 and an upper rigid plate 14. Reinforcing elements 9, 12, which are cloths impregnated with a resin, are positioned between the decorative element 11 and the polyurethane shell 13 and the upper rigid plate 14. The

polyurethane shell 13 is impervious and capable of displaying properties of adhesion with the resin of the reinforcing elements 9, 12. The polyurethane shell 13 and the upper rigid plate 14 are sealed *(see col. 4, lines 30-34)*, such that the foam core 16 contacts the polyurethane shell 13 and the upper rigid plate 14 and will not separate therefrom.

To form the molded article, the polyurethane shell 13, the upper rigid plate 14, the reinforcing elements 9, 12 are positioned in a mold and the mold is closed. The constituents of the foam core 16 are injected into the interior defined by the polyurethane shell 13 and the upper ridge plate 14 *(see col. 4, lines 19-22)*. An exothermic reaction occurs as the foam core 16 expands and the resin adhesively bonds the polyurethane shell 13, the upper rigid plate 14, the reinforcing elements 9, 12, the decorative element 11, together with the foam core 16 (*see col. 3, lines 50-68)*. Bauvois is silent as to the type of foam core 16, but, those skilled in the art recognize that there are various types of foams made from plastic and made from polyols and isocyanates, such as for example, rigid polyurethane foams, semi-rigid polyurethane foams, flexible polyurethane foams, high resilience polyurethane foams, and the like.

As stated by the Examiner in the Final Rejection of May 11, 2004, the Examiner contends that Bauvois teaches essentially the same polyurethane foaming process and the same damping applications of the claimed invention. From this, the Examiner believes that suitable microporous foam is taught or is an obvious optimization to one skilled in the art motivated to provide required damping properties. The Examiner also relies on Krech (United States Patent No. 6,063,824) for a teaching of using a microcellular polyurethane elastomer for a vibration and shock damping system.

Applicants respectfully contend that the Examiner has failed to establish a prima facie case of obviousness. As discussed above in the Summary of the Invention, the Applicants are not claiming to be the first to invent thermoplastic polyurethane (TPU) moldings or microcellular polyurethane elastomers, individually. Both TPU molding and microcellular polyurethane elastomers are known individually and have been used in various applications. However, Applicants are claiming to have been the first to combine these into a composite damping element in motor vehicle construction to be received in and to dampen and absorb vibrations of the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber *(see page 9, lines 4-9 of the originally filed specification.)*.

When applying 35 U.S.C. §103, the following tenets of patent law *must* be adhered to:

(A) The claimed invention *must be considered as a whole*;

(B) The references *must be considered as a whole* and must suggest the desirability and thus the obviousness of making the combination;

(C) The references must be viewed *without the benefit of impermissible hindsight* vision afforded by the claimed invention; and

(D) Reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).* The law is further set forth in the Manual for Patent Examining Procedure (MPEP) at §2142 "Legal Concept of *Prima Facie* Obviousness".

To establish a *prima facie* case of obviousness, three basic criteria must be

met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See also *In re Sang Su Lee*, 277 F.3d 1338 (Fed. Cir. 2002), citing *Brown & Williamson Tobacco Corp. v. Phillip Morris, Inc.*, 229 F.3d 1120, 1124-25 (Fed. Cir. 2000).

I.) LACK OF SUGGESTION OR MOTIVATION

Applicants respectfully contend that the Examiner has failed to provide some teaching, suggestion, or motivation within the references themselves that would lead one of ordinary skill in the art to combine the references.

Bauvois states that the complex molded article is traditionally meant to be a molded structure comprising stiffening or reinforcing elements being in the form of wires or in the form of cloths, plates, protection elements, and/or various mechanical elements such as, damping elements, lightening elements, and/or decoration elements *(see col. 1, lines 12-20)*.

As discussed above, the composite damping element of the subject invention replaces composite elements based on metals and rubber, generally known as rubber-metal composites in the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber of

motor vehicles. One skilled in the art of rubber-metal composites for motor vehicle running gears would not look to complex molded articles, and specifically skis, to replace the metal composites with the two layer composite damping element of the subject invention. Further, those skilled in the art recognize that the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber refer to specific components of motor vehicles. Said another way, many elements are capable of absorbing shocks and vibrations without being suitable as a shock-absorber of a motor vehicle. The composite damping element replaces composite elements based on metals and rubber, generally known as rubber-metal composites widely used in running gears of road vehicles *(see page 9, lines 4-15 of the originally filed specification and Figures 1-3).*

For example, the shock-absorber of the motor vehicle would typically include a rubber-metal composite wherein the metal portion is supported by a shaft within the shock-absorber and the rubber portion is positioned to absorb and dampen vibrations received by the shock-absorber. The subject invention replaces the rubber-metal composite with the thermoplastic polyurethane molding (i) supported by the shaft within the shock-absorber and the microcellular polyurethane elastomer layer (ii) positioned to absorb and dampen vibrations received by the shock-absorber. These rubber-metal composites have disadvantages that include high density of the metal constituents, short service life of the rubber, and loss of adhesion between the rigid metal and the flexible rubber *(see page 1, lines 20-34 of the originally filed specification).* The subject invention overcomes these disadvantages.

Therefore, such a disclosure as Bauvois does not lead one skilled in the art to the claimed composite damping element to be received in the transverse link, the

longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber. Absent a teaching or motivation within the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings, it is improper for the Examiner to combine the references.

Further, Krech et al. (United States Patent No. 6,063,824) discloses a process for the production of microcellular polyurethane elastomers and their use as dampening elements. Krech et al. does not provide any disclosure of composite elements comprising microcellular polyurethane elastomers chemically bonded to thermoplastic polyurethane moldings as claimed in Claim 19. One skilled in the art would not be motivated to combine the teachings of Krech et al. with the disclosure of Bauvois to arrive at the claimed invention.

II.) IMPERMISSIBLE HINDSIGHT

Applicants further contend that the Examiner is relying on impermissible hindsight to reach a determination of obviousness and there is no suggestion, teaching, or motivation, without relying on such impermissible hindsight. To avoid hindsight, the Examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the Examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of Applicant's disclosure must be put aside in reaching this determination. The tendency to resort to "hindsight" based upon Applicant's disclosure is often difficult to avoid due to the very nature of the

examination process. However, impermissible hindsight *must be avoided* and the legal conclusion *must be reached on the basis of the facts gleaned from the prior art. See MPEP §2141.*

If one skilled in the art viewed the references without hindsight, the combination is unlikely to have resulted in a composite damping element received in a transverse link, a longitudinal link, a triangular link, a rear-axle subframe, a stabilizer, a spring-strut support, or a shock-absorber, especially to replace rubber-metal composite damping elements. Bauvois is directed toward forming a complex molded structure, especially a ski *(see col. 1, lines 9-10)*, whereas the subject invention does not claim such a structure. The subject invention claims a composite damping element having a first layer of a thermoplastic polyurethane molding (i) and a microcellular polyurethane elastomer layer (ii).

Bauvois states that the complex molded article is traditionally meant to be a molded structure comprising stiffening or reinforcing elements being in the form of wires or in the form of cloths, or even in the form of plates, protection elements, and/or various mechanical elements such as, damping elements, lightening elements, and/or decoration elements *(see col. 1, lines 12-20)*. Such a disclosure does not lead one skilled in the art to the claimed composite damping element to be received in the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber. More specifically, such a disclosure does not suggest to one skilled in the art to replace composite elements based on metals and rubber with the complex composite element of Bauvois.

III.) FAILURE TO TEACH OR SUGGEST ALL THE CLAIM LIMITATIONS

Applicants also respectfully contend that the references do not teach or suggest all of the claim limitations.

First, Bauvois does not teach or suggest the claim limitation of the composite damping element received in the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber. More specifically, referring to page 9, line 5 of the originally filed specification, the composite damping element of the subject invention is used in bearings of motor vehicle construction such as the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber. Whereas, Bauvois is traditionally meant to be a complex molded structure comprising stiffening or reinforcing elements, which may comprise a damping element. The subject invention comprises only two layers, the thermoplastic polyurethane molding (i) and the microcellular polyurethane elastomer layer (ii). The subject invention does not include additional stiffening or reinforcing elements as taught by Bauvois, nor would one skilled in the art desire such elements to replace the two layer rubber-metal composites.

Second, Bauvois does not teach or suggest the claim limitation of chemically bonding the microcellular polyurethane elastomer layer (ii) to the thermoplastic polyurethane molding (i) to produce the composite damping element *(see page 1, lines 5-15 and page 2, lines 13-25 of the originally filed specification)*. On the contrary, Bauvois discloses using resin impregnated cloths to create the adhesion between the foam core 16 and the polyurethane shell 13 and the upper rigid plate 14. As the exothermic reaction of the foam core 16 occurs, the heat causes the resin of the reinforcing elements 9, 12, to adhesively bond to the polyurethane shell 13 and the

upper rigid plate 14. There is no disclosure of the foam core 16 chemically bonding with the polyurethane shell 13 and the upper rigid plate 14. In col. 4, lines 35-46, Bauvois clearly reveals that the bond between the core 16 and the shell 13 or the plate 14 is adhesive in nature, not chemical. The reference discloses use of a preparation treatment to promote adhesion such as electrochemical treatment to create a microporous and rugose, or wrinkled, oxide layer for adhesive bonding.

It is the chemical bond between the microcellular polyurethane elastomer layer (ii) to the thermoplastic polyurethane molding (i) of the present invention that is believed to produce the significantly improved adhesion therebetween without using other adhesives or resins. Those skilled in the art would anticipate that a composite element that does not include the additional adhesives or resins would not have such significant improvements in adhesion as exhibited by the subject invention.

Further, Bauvois is silent about the foam core 16 having excess isocyanate groups for bonding with the polyurethane shell 13 and the upper rigid plate 14. The resin impregnated cloths in between the foam core 16 and the polyurethane shell 13 and the upper rigid plate 14 are used to prevent separation. The interface between the foam core 16 and the polyurethane shell 13 and the upper rigid plate 14 is not required to have the same adhesion properties of the claimed invention.

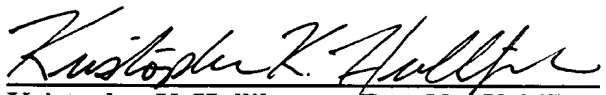
In summary, an obviousness rejection using the prior art of record cannot be sustained against Claims 19, 20, 22, 23, and 30. It is respectfully submitted that the rejection of these claims under 35 U.S.C. §103 is improper and the Examiner's position in this rejection must be reversed.

CLOSING

For the reasons set forth above, the rejections of Claims 19, 20, 22, 23, and 30 under 35 U.S.C. §103 based on the cited references must be reversed.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS, P.C.



December 23, 2004
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CERTIFICATE OF MAILING

I hereby certify that the attached Appeal Brief for application serial number 09/456,371 filed December 8, 1999 is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the Mail Stop Appeal Brief – Patents, Commissioner of Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on this **December 23, 2004**.

Melissa Dadisman

Melissa Dadisman

Appendix

Claims 1-18 (Cancelled).

19. (Previously presented) A composite damping element received in a transverse link, a longitudinal link, a triangular link, a rear-axle subframe, a stabilizer, a spring-strut support, or a shock-absorber, said composite damping element comprising:

i) a thermoplastic polyurethane molding having a thickness of from 2 to 10 mm, and

ii) a microcellular polyurethane elastomer layer chemically bonded to and in direct contact with at least one surface of said thermoplastic polyurethane molding such that said microcellular polyurethane elastomer layer dampens and absorbs vibrations of the transverse link, the longitudinal link, the triangular link, the rear-axle subframe, the stabilizer, the spring-strut support, or the shock-absorber.

20. (Previously Presented) The composite element of Claim 19 wherein said elastomer has a density of from 300 to 700 kg/m^3, a tensile strength to DIN 53571 of from 3 to 8 N/mm^2, an elongation at break to DIN 53571 of from 350 to 550%, a tear propagation resistance to DIN 53515 of from 8 to 30 N/mm, and a rebound resilience to DIN 53512 of from 50 to 60%.

Claim 21 (Cancelled)

22. (Previously Presented) The composite element of Claim 19 wherein said elastomer layer is bonded to an inner surface of said molding.

23. (Previously Presented) The composite element of Claim 19 wherein said elastomer layer is bonded to an outer surface of said molding.

Claims 24-29 (Cancelled).

30. (Previously presented) The composite element of Claim 19 wherein said thermoplastic polyurethane molding is formed from isocyanates and isocyanate reactive components in a ratio of isocyanate groups to isocyanate reactive groups of greater than 1.06:1 such that said excess isocyanate groups are available for chemically bonding with said microcellular polyurethane elastomer layer.